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**GB A 2126344 GB A 2070292 EP A1 0015525
GB A 2103386 EP A2 0091031**

(58) Field of search

**H2E
G3N**

(54) **Timing device for a plug,
socket or socket connector**

(57) A plug, socket or socket connector having a timing device for controlling when power is switched on or switched off to an appliance, the timing device having a microprocessor such as a 4-bit or 8-bit microcomputer. The timing device has its body formed as, or is attached to, an electrical plug 1, socket or socket connector.

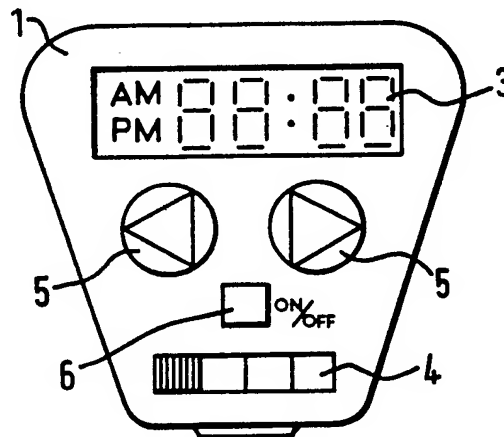


FIG.1A.

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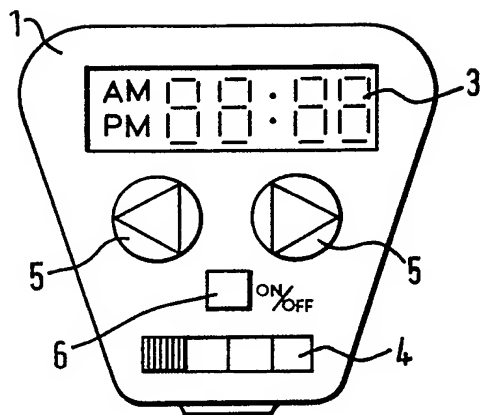


FIG. 1A.

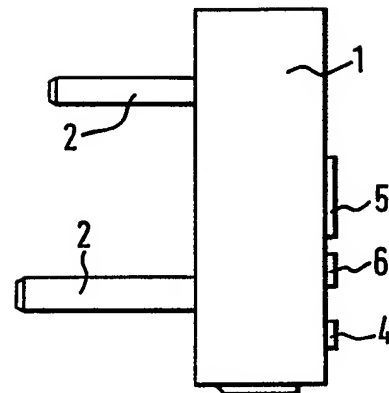


FIG. 1B.

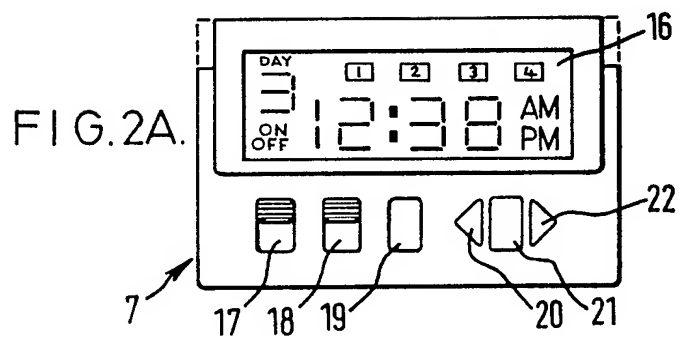


FIG. 2A.

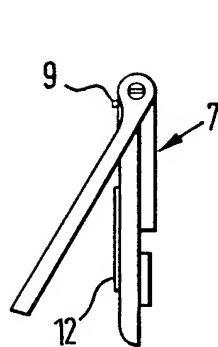


FIG. 2B.

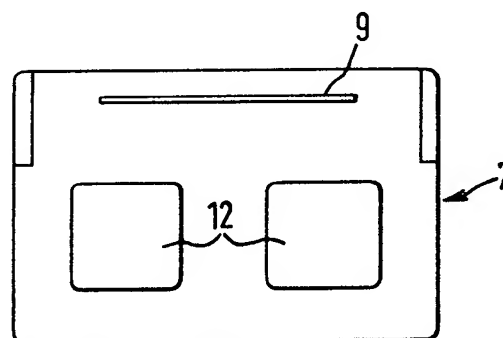


FIG. 2C.

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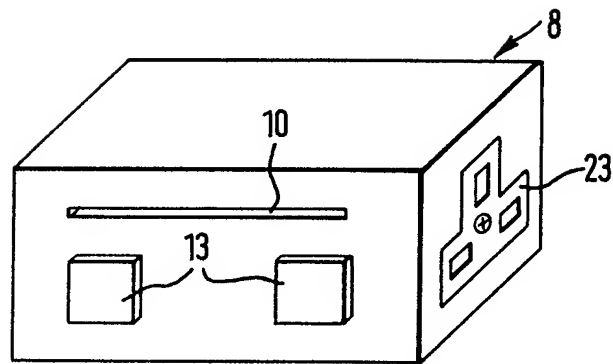


FIG. 3A.

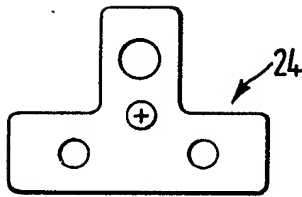


FIG. 3B.

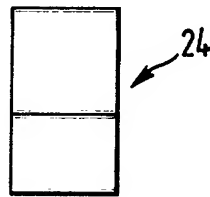


FIG. 3C.

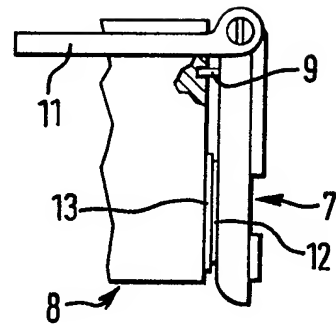


FIG. 3D.

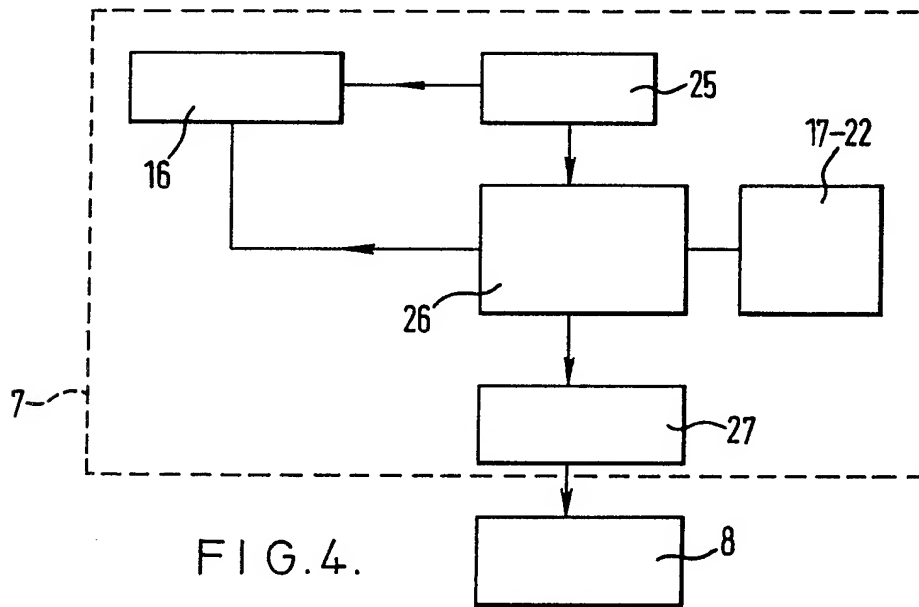


FIG. 4.

SPECIFICATION

Timing device for a plug, socket or socket connector

5 The invention relates to a timing device for an electrical plug, socket or socket connector (adaptor).

The present invention provides a timing device for electrical apparatus, the timing device being in or attached to an electrical plug or socket or socket connector, and comprising a microprocessor which can be set to determine the time when electrical supply is connected to the electrical apparatus.

The microprocessor is able to control electrical supply to an appliance connected to the plug, socket or socket connector for a period of time which can be set by the user, a 4-bit or 8-bit microcomputer being preferred. Although the main function of the microprocessor may be for controlling the time during which the electrical supply is connected, other functions such as measurement of room temperature and thermostatic control in accordance with room temperature can be performed by programming the microprocessor.

The invention will be further described, by way of example, with reference to the accompanying drawings, in which:

Figure 1A is a plan view of an electrical plug incorporating a timing device;

Figure 1B is a side view of the plug shown in *Fig. 1A*;

Figure 2A is a front view of a time controller which can be attached to the electrical connector of *Fig. 3A*;

Figures 2B and 2C are side and rear views of the controller of *Fig. 2A*;

Figure 3A is a perspective view of an electrical adaptor or socket connector;

Figure 3B is a view of a replaceable socket module for the connector of *Fig. 3A*;

Figure 3C is a side view of the module of *Fig. 3B*;

Figure 3D shows the connector of *Fig. 3A* or *3B*, associated with the controller of *Fig. 2A*; and

Figure 4 is a block diagram showing the function of the timing device.

Figures 1A and 1B

A 3-pin plug has a body part 1 and electrically-conductive pins 2. An LED display panel 3 is coupled to a timing device comprising a microprocessor or microcomputer (not shown) which is responsive to the time set by the user. The display device 3 displays the actual time and has its own (battery) power supply. A mode selection switch 4 is incorporated, together with at least one time setting switch 5. The modes of the switch 4 can be "normal (clock)", "start time setting", "end time setting" and "clock setting"; the left-hand switch 5 is for setting the clock forwards

(minutes and hours) whilst the right-hand switch 5 is for setting the clock backwards (minutes and hours).

If desired, an on/off switch 6 can be provided on the plug itself. This can be arranged to be between the appliance and the timing device so that the timing device remains operative even though the appliance is switched off: alternatively, the switch 6 can be between the power supply and the timing device so that it also switches off the timing device.

It will be seen that the whole arrangement is substantially within a standard plug of standard size.

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Figures 2A-3C

Fig. 2A shows a time controller 7 which can be attached to the electrical socket connector 8 shown in *Fig. 3A*, as illustrated in *Fig. 3D*. In other words, the socket connector (which could be modified to be a plug or a socket) has the timing device as a separate detachable or clip-on entity. The composite apparatus consists of two parts, namely the socket connector 8 and the time controller 7.

The time controller 7 has an elongate projection 9 on its back (see *Figs. 2B and 2C*) which enters a slot 10 in the socket connector 8 (see *Fig. 3D*). If desired, an open frame stand 11 on the time controller 7 can be used to engage over the socket connector 8, to hold the time controller 7 in position. The time controller 7 carries two slightly raised conductive plates or terminals 12 which engage corresponding terminals 13 on the socket connector 8. If desired, the terminals 13 on the socket connector 8 may be permanently magnetised and the terminals 12 ferromagnetic.

In a general sense, the arrangement of the front of the time controller 7 can be like that of the plug illustrated in *Fig. 1A*. As shown in *Fig. 2A*, the time controller 7 has an LCD display panel 16, mode selection switches 17 and 18, and adjustment buttons 19 to 22. The modes of the mode selection switch 17 can be "clock" or "switching". The modes of the time selection switch 18 can be "time resetting" or "normal". Button 19 selects the number of time intervals which are set. Buttons 20, 21 and 22 alter the time settings when the switches 17 and 18 are in the appropriate set mode, namely "backwards", "alter time setting" and "forwards".

As shown in *Fig. 2B*, the stand 11 enables the time controller 7 to stand up on its own as a desk-top clock, i.e. the time controller 7 can be used separately from and independently of the socket connector 8, for instance as a desk-top alarm clock or as a portable travel alarm clock. The alarm clock can be of the multiple type, i.e. giving an alarm signal at a number of different times.

The socket connector 8 contains a switch such as a triac, controlled by the output from

the time controller 7.

The socket connector 8 can be provided with normal pins (not shown) for engaging in a standard socket. The socket connector 8 has a detachable module 23 which provides a standard socket; by replacing the module 23 by another module such as the module 24 shown in Figs. 3B and 3C, a different standard plug can be accommodated.

Figure 4

Fig. 4 is a block diagram for either of the timing devices described above, but is referenced as for Figs. 2A to 3D. In general, the appliance whose electrical supply is being controlled will be fed (through a power cable in the case of Fig. 1A and by connection to the sockets in the case of Figs. 2B to 3C) for a period of time set by the user. Short, predetermined periods of power connection can be provided for, and it will be noted that both power connection and power disconnection can be timed.

The diagram shows a power supply 25, such as a battery, a 4-bit or 8-bit microcomputer 26, the setting switches or buttons 17-22, the display panel 16, a power switch 27 such as a triac, all contained within the time controller 7, and the socket connector 8.

The device of Figs. 1A and 1B or of Figs. 2A to 2C can be arranged to give an alarm signal or output and can incorporate a small speaker piezoelectric buzzer for this purpose. The signal or output can be arranged to be given at start and after a predetermined period, and to last for 10 or 50 seconds.

The device can be incorporated a thermostatic switch, responsive to room temperatures, for instance having an upper limit for switching off and a lower limit for switching on.

CLAIMS

1. A timing device for electrical apparatus, the timing device being in or attached to an electrical plug or socket or socket connector, and comprising a microprocessor which can be set to determine the time when electrical supply is connected to the electrical apparatus.

2. The timing device of Claim 1, and settable for one or more periods of time during which the electrical supply is connected to the electrical apparatus.

3. The timing device of Claim 1 or 2, and arranged to give an alarm at a start time and end time which have been set.

4. The timing device of any of Claims 1, 2 and 3, and incorporating a thermostatic switch responsive to room temperature.

5. A timing device, substantially as herein described with reference to, and as shown in, Figs. 1A and 1B or Figs. 2A to 3D of the accompanying drawings.

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